Medical Education

The Changing Dynamics of Graduate Medical Education

Implications for Decision-Making

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Cost-containment pressures and changes in traditional patient-care patterns are altering the process of graduate medical education. A thorough understanding of this process is a prerequisite to implementing changes that preserve the function of graduate medical education. This report describes the structure of the graduate medical education system and analyzes possible responses to the changes that are affecting it. The decision-making process within academic health centers is described, including an assessment of the roles of hospital directors, deans and faculty, as well as external regulatory agencies such as residency review committees, medical specialty boards and state licensing agencies. The activities of these participants are analyzed within the framework of the teaching hospital's service and education functions, and potential conflicts are described and illustrated by recent examples. Understanding the complex structure and functions of graduate medical education is a first step toward responding effectively to a changing environment.

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The system that delivers graduate medical education in the United States grew in a haphazard manner during the first part of the 20th century.[1] Mechanisms for funding graduate medical education, for accrediting residency programs, for licensing and certifying physicians' competence and for teaching residents in hospitals were all created independently. In spite of its random growth pattern, however, graduate medical education has functioned as a stable process.

This stability is now being threatened by effects of the health care fiscal "crisis." Before this crisis arose, graduate medical education was funded routinely from patient-care fees and government subsidies. Now, changes in third-party payment and reductions in state and federal funding have prompted closer examination of the ways in which graduate medical education dollars are spent. Questions are being raised about how many residents are necessary, how residents should function and which medical specialties are in demand—issues that have a direct financial impact on graduate medical education. Various proposals from the federal government (for example, from Congress, the executive branch and the Inspector General's Office), as well as activities in the private sector, suggest that there may soon be substantial changes in the way that graduate medical education is financed. As these changes take place, unresolved issues in the graduate medical education system are sure to come under sharp scrutiny.

In 1984 the Task Force on Academic Health Centers commissioned a report on the graduate medical education system.[2] In compiling this report, we were asked to provide an in-depth examination of the decision-making process and participants in graduate medical education today. To do so, we reviewed relevant literature and interviewed persons across the country who play key roles in the graduate medical education system.* Our draft report was distributed widely in an effort to validate our findings, and we continued to revise the written document until consensus was achieved regarding the accuracy of our description.

As data were collected, it was found that often key persons within one part of the system did not understand how graduate medical education works on a larger scale, that many held erroneous beliefs about the process of graduate medical education and that policymakers were making decisions while unaware of some crucial interdependencies in the system. Nevertheless, it was clear throughout the course of our research that the people with responsibility for graduate medical education are eager to bridge the gap between what they now know and what they must learn to continue to have a robust system.

By elucidating the structure of graduate medical education and the problems inherent in the graduate medical education process, this paper is intended as a tool for those who will guide the system through the period of transition that has already begun. To provide a starting point, we first describe how the financial crisis in health care has affected the graduate medical education system.

*Numerous persons at academic health centers, government agencies and regulatory bodies within the medical education system contributed to this report by giving generously of their time and professional knowledge.

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Effects of Changes in Medical Care Payment

New ways of funding health care have already altered the pattern of graduate medical education. One immediate effect has been to make its costs more visible. The previous indirect subsidy of graduate medical education by patient-care dollars (and in some institutions by research funds) is no longer assured. Instead, as hospital payment has shifted to fixed price per admission (Medicare) or selective contracting, the costs of graduate medical education have become more clearly separated from other expenses. A prime target for reduction in the federal budget is funding of health manpower training. Additional pressure has been brought to bear by reductions in state revenues. These changes are reflected in budget cuts to state-supported medical schools, which in turn may reduce support of residency programs. In California, for example, the state legislature has reduced all state-supported funding for non-primary care graduate medical education programs for each of the past three years.

The University Hospital as Competitor for Health Care Dollars

Changes in the funding of patient care have also encouraged the growth of health maintenance organizations, for-profit hospital chains, and price-competitive contracts for patients in hospital. As a result, there has been increasing pressure for academic health centers to compete for a portion of the health care market. They are at a disadvantage in this arena, however, because their costs of care appear to be greater than in nonteaching hospitals. In effect, patients may be directed away from teaching hospitals, as exemplified by a recent corporate publication for employees (The Quaker Oats Company: Informed Choices, Chicago, 1985) on how to lower health care costs. The publication includes the following admonition: "If it's a teaching hospital, you can count on its prices being two or three times as high as a non-teaching hospital. Teaching hospitals are not necessary for routine care or surgery." Another example is the Select Care plans of Blue Cross/Blue Shield of Maryland, which accept only low cost hospitals, thereby excluding the Johns Hopkins Hospital (Burns MK: "Blue Cross Unveils Plan to Cut Costs," *Baltimore Sun*, May 1, 1984, pA1).

Altered Patterns of Patient Care

New financial incentives have led to altered patterns of patient care, a process that in teaching hospitals has had important consequences for graduate medical education.[3] Hospital length of stay is declining as payment-per-admission creates incentives to transfer patients who require convalescent care to extended care facilities, nursing homes or their own homes.

To assure the flow of patients, academic health centers must continue to develop and market specialized services that are not yet available in the community, such as bone marrow transplantation and sophisticated radiologic diagnostic facilities. This emphasis on specialized care may result in training experiences for residents that lean toward greater exposure to critically ill patients and those with unusual problems, and away from patients with problems that are more likely to be seen in subsequent practice.

Aside from these changes in patient care, the very real prospect of "losing business" has prompted hospital directors and their boards to reconsider the service and educational functions of their institutions. Chief executive officers are starting to assess the benefits and drawbacks of employing residents and are beginning to consider the potential conflict between training residents and providing cost-effective care. These issues are not easily resolved, and the data needed to resolve them are not readily available.

Scope and Purpose of Graduate Medical Education

Although graduate medical education was first established around the turn of the century, it was not until after World War II that the number of residency programs and positions began to rise rapidly in response to the growing demand for advanced training beyond the internship. From 1950-1951 to 1973-1974, the number of residency positions grew from 29,000 to 66,000. By 1983 the approximately 4,800 approved residency programs in the United States offered nearly 75,000 residency positions.

This rapid rise in the number of residents was spurred largely by the need of teaching hospitals to provide patient care services at the lowest possible expense. The perception of residents as a labor resource has placed them in the dual roles of employee and student. Since residents' labor is essentially purchased by the hospital, it could be argued that the service function of housestaff overrides their education goals. The intellectual and philosophical considerations crucial to a physician's training, however, clearly fall within the educational scope and outside of a hospital's responsibility to its staff.

Even the courts have had difficulty in deciding whether the resident is considered an employee or a student. In a recent court case concerning the tax status of stipends, the California State Court of Appeal ruled that housestaff are primarily students, overturning a decision by the Public Employment Relations Board that housestaff are employees.[4] The appeal ruling held that residents' service function is subordinate to their education experiences.

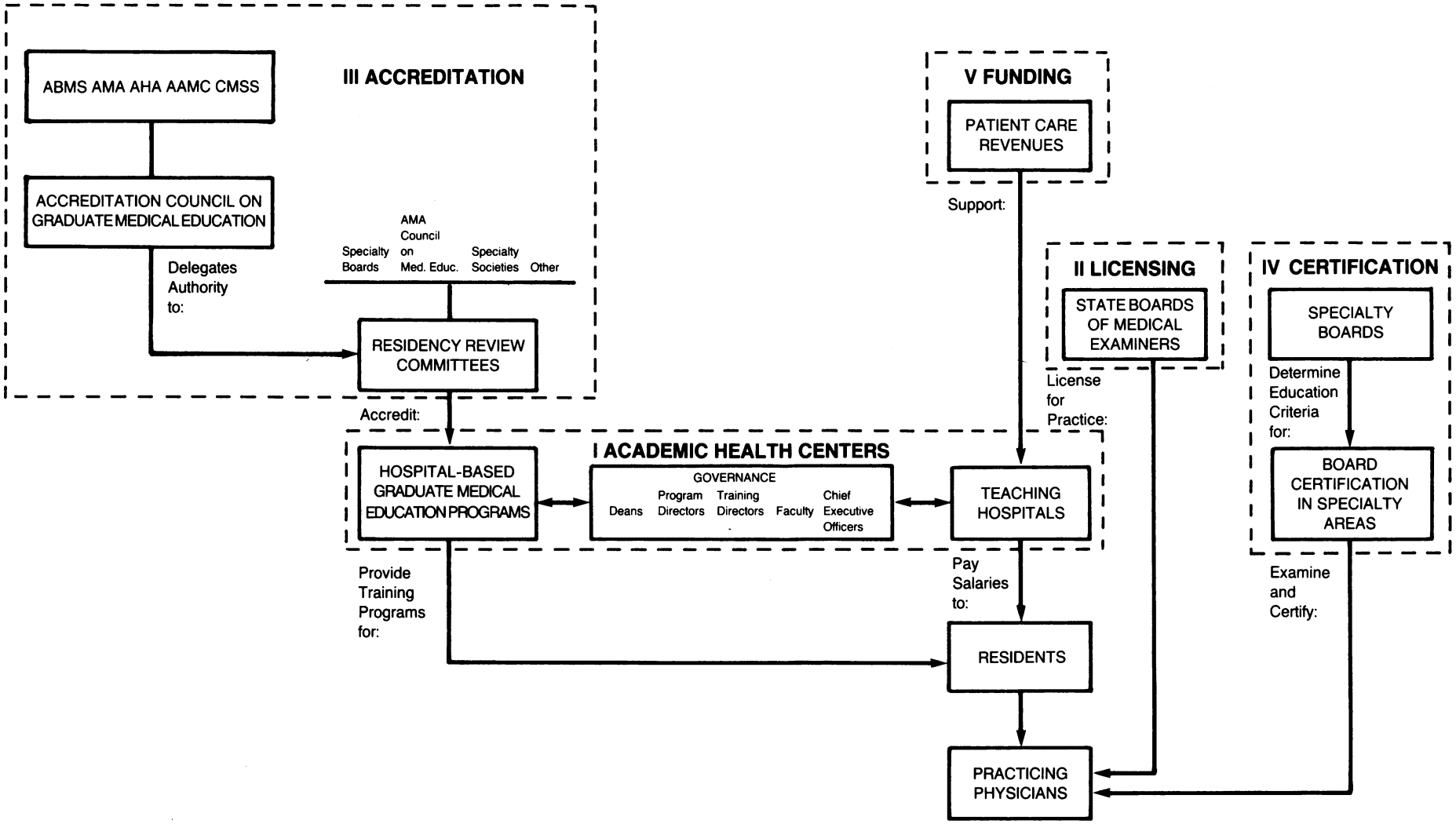
The Decision-Making Process in Graduate Medical Education

The numerous groups and individual persons who act as decision makers in graduate medical education, and their relationships to one another, are depicted in Figure 1. This figure shows the key decision makers within the academic health centers (area I), those who license physicians to practice (area II), those who accredit residency programs (area III), those who examine and certify residency graduates for practice in medical specialties (area IV) and, finally, those who pay for graduate medical education (area V).

Key Decision Makers Within the Academic Health Center

Decision makers within academic health centers (Figure 1, area I) have a major influence on the number of positions available within residency programs and the content of those programs. Depending upon the structure of the institution and on other factors described below, the size and content of residency programs are governed to varying degrees by the dean of the medical school, the chief executive officer of the teaching hospital, program directors for each residency program and training directors who work under the program directors to administer housestaff education within a department. These persons' comparative influence on graduate medical education varies among institutions.

Figure 1
PARTICIPANTS IN THE GRADUATE MEDICAL EDUCATION SYSTEM*



*Adapted from **PRESCRIPTION FOR CHANGE: Report of the Task Force on Academic Health Centers.** The Commonwealth Fund, 1985.

Determining the Number of Residents. The chief executive officer, whose first concern is the service needs of the hospital, can be a key figure in determining the number of positions available in residency programs. This is most true in institutions that use a formula to establish program size. Although not common, these formulas, which are based on the number of beds per service or some variation thereof and are calculated annually, place the control of the number of residents, both total and per service, primarily under the jurisdiction of hospital management.

Some institutions have frozen the total number of residents funded through hospital revenue. Departments that wish to have more residents than the number allocated must fund the additional positions through mechanisms other than patient care revenue from the hospital.

In the absence of a formula, certain decision makers exercise greater influence than others. For example, in those hospitals where faculty practice plans or other medical-school dollars contribute to housestaff training, the dean may play a major role in determining the number of residents. The dean may be influenced in this calculation by the number of residents needed to maintain an adequate teaching staff for medical students.

Although program directors usually have limited control over the size of their programs, each department's stature with hospital chief executive officers and deans may be influenced by the generation of research or practice plan funds as well as by historical allegiances. The decision-making role of faculty also rests to a large degree on the extent to which practice-plan income contributes to funding. Like the dean and program director, faculty want sufficient staff to fulfill the department's teaching requirements, but they also want to ensure sufficient time to pursue research. It has also been suggested that some faculty's desire to "replicate" themselves through residents may motivate them to lobby for more residents than are actually needed to meet the service needs of the hospital or the manpower needs of their specialty.[5]

Establishing the Content of Residency Programs. To meet service needs, chief executive officers hire residents to staff certain units or services, such as intensive care units or emergency rooms. Such channeling of resident manpower may not necessarily coincide with an optimal educational program.

Once the service needs of the hospital have been determined, program directors are the most active decision-makers in deciding what residents will learn. Most program directors serve as both the medical school department chair and chief of that service in the teaching hospital; as such, they often have day-to-day input into the content of residents' experiences.

Key Participants Outside the Academic Health Center

The academic health center is not autonomous in its decision making. External agencies that license physicians, accredit residency programs and issue specialty certificates influence both the size and content of graduate medical education programs. These regulatory agencies are located either within state government (licensing authorities) or in the private sector (accrediting and certifying authorities).

As shown in Figure 1, the licensure (area II), accreditation (area III) and certification systems (area IV) function as separate gatekeepers in the graduate medical education system. In general their responsibilities are distinct; overlaps among the systems are minimal and informal.

Licensure. As a prerequisite to licensure (area II), most states require one or more years of accredited residency training as well as a passing score on all three examinations of the National Board of Medical Examiners. No other test is necessary, although graduates who have not taken National Boards must pass the Federation Licensing Examination.

Accreditation of Residency Programs. The Accreditation Council for Graduate Medical Education (ACGME) is responsible for accrediting and reviewing programs in graduate medical education. The ACGME is composed of representatives of five organizations: (1) the American Medical Association, (2) the American Hospital Association, (3) the Council of Medical Specialty Societies, (4) the American Board of Medical Specialties and (5) the Association of American Medical Colleges. The ACGME has the authority to delegate its responsibility to residency review committees within each of 23 specialty fields. All of the residency review committees have requested and been granted this authority. The residency review committees are composed of members appointed by (1) the Council on Medical Education of the American Medical Association, (2) the appropriate specialty board and, in some cases, (3) the specialty society (for example, the American College of Surgeons). (See Figure 1, area III.)

Each residency program must conform to a set of general and specialty-specific requirements, which together are labeled "The Essentials of Residencies," published by the ACGME and often called "The Green Book."[6] The general requirements, created by the ACGME, must be complied with by all graduate medical education programs. The special requirements, prepared by the residency review committees, generally concern faculty, administration and program content; occasionally they also stipulate required numbers of procedures per resident. Each residency review committee also stipulates a minimum length of program, ranging from three years for some specialties (such as internal medicine) to six years (for example, neurosurgery).

Special requirements are changed as deemed necessary by the residency review committees, but must also be approved by the ACGME. All changes are reviewed by the parent organizations (the specialty board and in some instances the specialty society) for comments, but these organizations, unlike the ACGME, cannot mandate changes or veto residency review committee decisions. Examples of recent changes in requirements include increases in the training period for anesthesiology, urology, neurosurgery and radiology.

After periodic review, a residency review committee may withdraw a program's accreditation or place it on probation for failure to meet general or special requirements. Such actions may be appealed through a process established by the ACGME.

Certification of Specialists. The medical specialty boards (Figure 1, area IV) also influence the residency training process. Certification by medical specialty boards designates a physician as having met requirements specified by the board and having successfully completed an accredited residency program. There are currently 23 specialty boards offering 31 types of general and 42 types of subspecialty certifications. To date, seven boards issue time-limited specialty certificates; 12 boards have approved plans for recertification procedures. No board has a procedure, however, that would remove previous certification from a physician.

Although physicians need not be board certified to practice a specialty, programs have some investment in their grad-

uates passing the board examinations; some residency review committees (for instance, general surgery) do include review of specialty board certification rates as an evaluation criterion for accrediting programs. Most residency review committees' special requirements state that certification rates are important.

There are other strong incentives for board certification. In some hospitals the certification system is linked to obtaining hospital privileges.[7] Malpractice premiums are sometimes keyed to specialty certification, with premiums varying according to the risks involved. Board certification may enhance employment possibilities if health maintenance organizations and medical care corporations increasingly come to use board certification as a hiring criterion. The public is also becoming more aware of the distinction of board certification.

There is no official relationship between medical specialty boards and residency review committees, but the two groups do work together for the most part when changes are made. For example, when the American Board of Radiology recently increased its residency training requirement from three to four years, the residency review committee subsequently made a similar change.

The Federal Trade Commission and Antitrust Laws. One mission of the Federal Trade Commission is to ensure that nongovernmental entities do not restrain persons from earning a livelihood in a given career. In medicine, the Federal Trade Commission monitors the policies of the accrediting and certifying bodies for potential exclusionary biases. They are especially vigilant for policies that may limit the number of persons entering a residency in a specialty of their choice. Thus, residency review committee requirements must be based on improving the quality of the educational experience and cannot directly restrict numbers within a specialty. The Federal Trade Commission also ensures that physicians can practice any specialty they choose, whether or not such physicians are board certified. In the past eight years the Federal Trade Commission has not seen a need to take action for restraint of trade against the program accreditation or physician certification systems. Nevertheless, the fear of being in violation of restraint-of-trade statutes is a powerful deterrent to attempts to adjust the numbers of residents according to specialty.

Problems Inherent in the Graduate Medical Education Decision-Making Process

A simple scanning of Figure 1 shows that there are no formal connections or lines of communication among key participants in the graduate medical education system. The absence of linkage between the component that funds residents and other areas in the system is particularly noteworthy. This means that residency review committees and boards can make decisions that affect the cost of training residents without first assessing the financial impact of such decisions and without collaborating with those who must implement the changes. Furthermore, problems among participants are difficult to resolve since there is no overriding authority to settle differences.

At teaching hospitals, the basic conflict demonstrated by Figure 1 is the difficulty of balancing service needs of hospitals with the educational needs (as set out by residency review committees and boards) of residents. Those who pay for graduate medical education and their "representative" at the hospital, the chief executive officer, are concerned with providing high quality patient care at the lowest possible cost. Others in the system are responsible for identifying what residents need to know and how they can learn it. This conflict of interest leads us back to the question of whether residents are employees, and therefore under the supervision of the hospital and its chief executive officer, or students, whose activities should be guided by the medical school as well as by the residency review committees and boards. It is obvious that the issue is not clear-cut and will not be fully resolved by a legal determination that residents are only employees or only students.

In the recent past, a variety of participants in the graduate medical education system have had minor policy disagreements with residency review committees or boards. Two disputes are described to convey a sense of the types of issues that arise when decision-makers have conflicting objectives. The examples given represent relatively minor problems but indicate the potential for more serious dilemmas as the education and service functions of hospitals become more discrepant.

The first example illustrates a discrepancy in goals between program and hospital management and members of the pediatrics residency review committee. During the 1970s, hospital chief executive officers assigned pediatric residents to staff neonatal and pediatric intensive care units in order to meet patient care needs. A number of program directors believed that many residents were spending a disproportionate amount of training time in intensive care units, to the detriment of the overall educational endeavor. In 1978 a Task Force on Pediatric Training determined that more than six months of intensive-care-unit experience was excessive.[8] Thus, the Pediatric Residency Review Committee now requires that the maximum amount of time a resident may spend in the intensive care unit is six months. The means of providing any required extra coverage was left to the hospital's discretion.

A second example involves a lack of parallelism in board and residency review committee requirements. Such a conflict is unusual, since actions by one group are typically followed by similar changes by the other and since many members sit on both bodies. The problem began when the American Board of Pathology increased the number of years required for board certification from four to five. The Board believed that the change was necessary to keep residents abreast of the information explosion in pathology and to preserve the status of pathology within the academic community. Members of the residency review committee and many academic pathologists felt, however, that they had not been adequately consulted before this change and that the board had been too hasty in this move. It was asserted that an impact report had not been fully developed and that the consequences of this change, including its financial impact, had not been explored. Colloton[9] predicted that this one change in requirements could cost teaching hospitals $21.3 million.

Conclusion

The conflict between meeting educational goals and satisfying the service-delivery mission of the hospital is perhaps the most pressing dilemma facing graduate medical education today. Teaching hospitals, determined to maintain their competitive edge, may elect to increase their technologic, intensive care and subspecialty capabilities. Two major unintended consequences appear to be emerging from these trends. First,

the disproportionate emphasis on specialty training in hospitals may leave the need for primary care physicians unmet.[10] Hospitals will continue to reap greater financial benefits from training specialists who carry out more procedures and provide services that are reimbursed at a higher level. Second, the training that many residents receive may become increasingly discrepant from that needed to ensure their success in future practice.[3]

Resolution of the issues raised in this article will require the cooperative effort of individual persons and groups who have distinctly different goals and interests. Yet the prospect of productive interaction is dim as long as the graduate medical education system continues to function without systematic communication or leadership. To effect positive changes while preserving the vitality of graduate medical education, a process that encourages a planned and coordinated transition needs to be found.

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Medical Practice Question

EDITOR'S NOTE: *From time to time medical practice questions from organizations with a legitimate interest in the information are referred to the Scientific Board by the Quality Care Review Commission of the California Medical Association. The opinions offered are based on training, experience and literature reviewed by specialists. These opinions are, however, informational only and should not be interpreted as directives, instructions or policy statements.*

Epikeratophakia in Children

QUESTION:

Is epikeratophakia, a form of refractive surgery that alters the anterior surface of the cornea with a preground donor tissue lens, accepted medical practice for the treatment of aphakia in children?

OPINION:

In the opinion of the Scientific Advisory Panel on Ophthalmology, epikeratophakia, a new form of refractive surgery, is gaining increasing acceptance as one alternative for the optical correction of aphakia in children following cataract removal. In epikeratophakia, the anterior surface of the cornea is altered by adding a machine-lathed donor tissue lens. Because it is a form of lamellar keratoplasty, the refractive error can be changed without carrying out intraocular surgery.

Research and experience to date indicate that this promising procedure may offer an exciting and potentially useful alternative to the difficult problem of fitting very young children with contact lenses. However, the results are still not well defined. Further refinements are necessary before full accuracy and stability can be obtained. It is difficult to analyze the result of this technique because it continues to evolve and there is lack of long-term follow-up. Obviously, further longitudinal studies are necessary.

Furthermore, in very young children, it is difficult or impossible to assess how well such a technique actually restores vision; technical success is easier to ascertain than visual success. Until the visual success rates can be determined to be as good as the technical success rates would indicate, epikeratophakia in children should be considered an investigational procedure that may have value for certain selected situations.